

### **REMARKS**

The present application had claims 1-3, 5-7, 10, 11-16, and 17 pending. Claims 12-15 have been withdrawn from consideration, but not yet canceled. Claims 1 and 10 have been amended herein and claim 11 has been canceled. Accordingly, claims 1-3, 5-7, 10, 16, and 17 are presently under examination.

Support for the claim amendment to claim 1 may be found throughout the specification, including in the specification on page 6, lines 20-24, and on page 7, line 30 to page 8, line 4, and in Figures 3 and 4. The amendment to claim 10 simply deletes the last clause of the claim. None of the amendments introduce new matter to the application.

In the October 13, 2010 Office Action, the Examiner rejected the pending claims under 35 U.S.C. §103(a) as rendered obvious by Nanaumi, *et al.* (US Patent Publication 2003/0049518) in view of Kuroki, *et al.* (US Patent Publication 2007/0196717). The Examiner maintains that the Nanaumi reference discloses all the claim elements of previously pending claim 1 except for the claim element requiring that the sealing material impregnates the edge regions of the gas distributor substrates to a depth of 1 mm. The Examiner maintains that this missing element is disclosed by Kuroki and that it would have been obvious for one of ordinary skill in the art to employ the seal of Kuroki to impregnate the edges of the gas diffusion layers of Nanaumi.

Applicants disagree with the Examiner's position, but nevertheless, have amended claim 1 to further distinguish the claimed invention from the cited prior art. Specifically, Applicants have added the limitations that the sealing material is an organic polymer that adheres to the membrane and that the sealing material seals the edge regions of the membrane electrode unit. With these additional claim limitations, claim 1 is clearly patentably distinct from the disclosures of Nanaumi and Kuroki.

Nanaumi and Kuroki do not disclose the newly added limitations to claim 1 which require that the sealing material adheres to the membrane and seals the edge regions of the membrane electrode unit. The references also fail to disclose the previously-added limitation of claim 1 that requires that the edges of the first and second gas diffusion substrates AND the unsupported portion of the membrane be surrounded by the sealing material.

Nanaumi does not disclose embodiments where the edges of BOTH gas diffusion substrates are surrounded by the same sealing material – i.e., an organic polymer that adheres to the membrane. Likewise, the surface of the membrane unsupported by a gas diffusion substrate in Nanaumi is not surrounded by a sealing membrane. There is no complete surrounding seal in Nanaumi that covers both the edges of the gas diffusion substrates and the unsupported surface of the membrane.

At best in Nanaumi, the edges of the catalyst layers and the outer edge of the membrane are surrounded by two different bonding layers (layers 36 and 52 in Figure 3) – see Nanaumi, paragraphs 50-57. Nanaumi does not disclose the use of a sealing material to surround BOTH gas diffusion substrates AND the unsupported surface of the membrane, and certainly does not disclose an organic polymer sealing material that adheres to the membrane, or that seals the edge regions of the membrane electrode unit. In Nanaumi, the seal between the gas diffusion layers and the bipolar plates 82 is done by seal members 90 and 92 (see Figure 6 of Nanaumi) which are elastomeric materials that are compressed to oval shapes – and are separate and distinct from bonding layers 36 and 52 used to seal the catalyst layers.

Additionally, Nanaumi fails to disclose embodiments where the edge regions of the gas diffusion substrates are impregnated by a sealing material – also a requirement of presently pending claim 1.

As for the Kuroki reference, Applicants initially wish to point out that the reference is not prior art to the present application. Kuroki published on August 23,

2007, from an application filed on April 13, 2007. This application was a divisional application whose parent was filed October 23, 2003 – three months after the July 14, 2003 priority date of the present application. Applicants note that although the parent application of Kuroki was a national stage filing of a PCT application, the PCT application was file and published in Japanese - so under MPEP 706.02(f)(1), Kuroki is not entitled to the PCT filing date as its effective date. Its earliest effective date is October 23, 2003, which is after the priority date of the present application.

Even if Kuroki was a proper reference, it does not disclose, teach or suggest the claim limitations missing from Nanaumi. Kuroki describes a two-component seal (see Figures 1 -10), whereas the presently claimed invention is a one-component seal using organic polymeric material. In Kuroki, a sealing material impregnates the gas diffusion layers - portions 10 and 11 in the figures - and gaskets 15 and 16 (which are made of "rubber-like elastomeric materials") are used between portions 10 and 11 and the separators 8 and 9 (see paragraph 101). The adhesive agent used for impregnating the substrates is described in paragraph 68 of Kuroki, while the material used as the gasket material is described in paragraph 75 --- TWO different materials.

Thus, the combination of Nanaumi and Kuroki still doesn't meet the present invention since there is no organic polymeric sealing material that surrounds the edges of the gas diffusion substrates and the unsupported surface of the membrane, and that seals the edges of the membrane electrode unit.

In light of the amendments and remarks above, Applicants request reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a) set forth in the October 13, 2010 Office Action and respectfully solicit allowance of the present application.

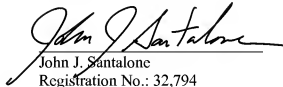
No fee is deemed necessary in connection with the filing of this amendment, other than the fee for the requested three-month extension of time and the fee for the accompanying RCE, both of which have been charged to credit card. If any additional

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fees are due, or an overpayment has been made, please charge, or credit, our Deposit Account No. 50-5371 for such sum.

If the Examiner has any questions regarding the present application, the Examiner is cordially invited to contact Applicants' attorney at the telephone number provided below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "John J. Santalone", is written over a horizontal line.

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